up by White (1916) and Serventy (1939), that samples of birds collected in different areas show striking disproportions in the sex ratio. Serventy offered the tentative explanation that females wander farther from the nesting stations than do the males. It would be desirable to have the sex determined of recovered banded birds for the elucidation of this interesting phenomenon.

SUMMARY

An analysis of 30 banding recoveries of Pied Cormorants (*Phalacrocorax varius*) ringed as nestlings in Western Australia has revealed the following life history:

(1) In their first year of life, cormorants disperse randomly along coastlines and up estuaries for distances up to 200 miles from their natal area. (2) Inland occurrences are rare. (3) Most birds in their second year return to an area relatively close to their birthplace. However, further banding is necessary to confirm this. (4) Mortality is high in immature birds and consequently probably low in adults.

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CHECK LIST OF WESTERN AUSTRALIAN SCORPIONS

By L. GLAUERT, Western Australian Museum, Perth.

Three families of scorpions are represented in the fauna of Western Australia, the Scorpionidae, the Buthidae and the Bothriuridae; of these the first two have a wide distribution in tropical and subtropical regions but the third is confined to Australia and South America.

The families are easily distinguished by the form of the sternum a structure situated in front of the genital operculum (Figs. 1 & 2). In the Scorpionidae it is pentangular or shield-shaped, in the Buthidae triangular and in the Bothriuridae reduced to a couple of narrow transverse bands placed end to end.

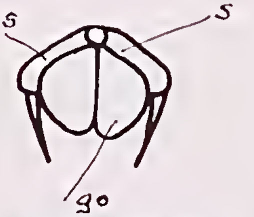

Fig. 1.—Details of genital area in the Family Bothriuridae; s, sternum; go, genital operculum.

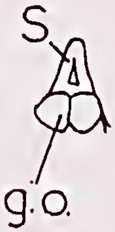

Fig. 2.—Details of genital area in the Family Buthidae; s, sternum; go, genital operculum.

I

Family BOTHRIURIDAE

Genus CERCOPHONIUS Peters

Small scorpions less than 40 mm. (1½ in.) in length.

Cercophonius michaelseni Kraepelin

Fauna S.W. Austr., vol. 2, part 7, p. 102.

Interior of Western Australia, from Cunderdin to Kalgoorlie and north to Bencubbin.

Cercophonius granulosus Kraepelin

Ib., p. 102.

Murchison district, Geraldton to Cue.

Cercophonius sulcatus Kraepelin

Ib., p. 103.

South-western Australia, from Perth to the south coast and inland to the Great Southern district.

KEY TO THE SPECIES

Tergites brownish with persistent yellowish vertebral band. Tail yellowish black-spotted laterally, the spotting extending to the ventral surface of the posterior segments. Vesicle yellowish. Last sternite with almost smooth lateral keels and faintly indicated median keels below. First caudal segment with two swollen granular median keels below .... *michaelseni*

Tergites brownish, each with a pale spot posteriorly or even absent. Tail and vesicle black-spotted. Last sternite without distinct keels.

Last sternite closely granular behind, first four caudal segments coarsely granular below but without distinct median keels .... *granulosus*

Last sternite somewhat wrinkled posteriorly, often with indications of lateral keels. First three or four caudal segments below with faint indications of five median keels, the depression between them often with a black longitudinal line .... *sulcatus*

II

Family BUTHIDAE

Sub-Family BUTHINAE

Genus LYCHAS C. L. Koch

Lychas marmoreus (C. L. Koch)

Lychas marmoreus marmoreus (C. L. Koch)
Southern Western Australia.

Lychas marmoreus variatus (Thorell)
Northern Western Australia.

Lychas marmoreus splendens Kraepelin
Murchison and further inland.

Lychas marmoreus kimberleyanus Kraepelin
Kimberley District and N.W.A.

Lychas mjobergi Kraepelin
Kimberley District.

Lychas bituberculatus (Pocock)
Shark Bay.

Lychas jonesae Glauert
Hampton Hill Station, Bulong.

Genus ISOMETROIDES Keyserling

Isometroides vescus (Karsch)
Widely distributed in southern Western Australia from the coast inland.

Isometroides angusticaudus Keyserling
From the Kimberley District south to the Murchison.

Sub-Family CENTRURINAE

Genus ISOMETRUS Hempr. and Ehrenb.

Isometrus melanodactylus (L. Koch)
West Kimberley.

Isometrus maculatus (Geer)
West Kimberley.

KEYS

Family BUTHIDAE

The distinguishing character is the triangular sternum which is well defined (Fig. 2).

Sub-Family BUTHINAE

Tibial spur on the third and fourth legs.

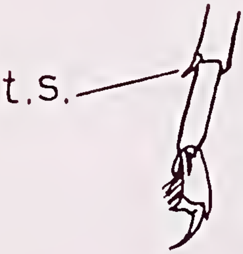

Fig. 3.--Tibial spur in the Family Buthidae.

Genus LYCHAS

Tooth under spine strong, triangular, pointed or small

KEY TO THE SPECIES

Tergites with indications of lateral keels.

Third caudal segment with 8 keels .... *L. jonesae* Glauert

Third caudal segment with 10 keels ...... *L. bituberculatus* (Poc.)

Tergites without indications of lateral keels.

Tooth under the spine minute .... *L. mjobergi* Kraepelin

Tooth under the spine large, usually with a dorsal tubercle, third caudal segment with ten keels.

Sternites dull, with a small triangular shining area near the posterior border of the third sternite. Sternites usually more or less pigmented with darker. Pectines and coxae pale with rarely indistinct darker markings on the coxae, tooth under the spine with dorsal tubercle .... *L. marmoreus marmoreus* (Koch)

Sternites more or less shining, the shining area not confined to the posterior margin of the third sternite. Pectines and coxae uniformly pale yellow. Sternites pale yellow but the posterior ones at times pigmented or suffused with darker.

Vesicle swollen, egg shaped, with median keel passing evenly into the lower edge of the tubercle, median keel of the tergites yellowish anteriorly. Fifth caudal segment with yellow ocelli. Pectines with 17-21 teeth .... *L. m. variatus* (Thorell)

Vesicle more or less cylindrical, its median keel not passing evenly into the lower edge of the tubercle but forming a distinct angle. Median tergal keels often, but not always, intensely blackish, vesicle usually uniformly reddish-brown. Pectines with 13-14 teeth .... *L. m. kimberleyanus* Kr.

Tooth under the spine conical, without distal tubercle. Fingers more or less blackish, sharply defined from the pale yellow hand. Vesicle brown, laterally with two rows of large yellow ocelli, almost cylindrical, its inferior median keel not passing gradually into the tooth under the spine, but forming a distinct angle. Pectines with 14-16 teeth .... *L. m. splendens* Kr.

Genus ISOMETROIDES

No tooth under the spine, the vesicle passing evenly into the spine.

KEY TO THE SPECIES

Fourth caudal segment with eight well developed keels and short accessory keels. Intercarinal surfaces granular, surface of the strong fifth segment punctured, rugulose. Spine shorter than the vesicle. Pectines with 21-23 teeth .... *I. angusticaudus* Kr.

Fourth caudal segment keel-less or very feebly keeled. Surface smooth, surface of the fifth segment punctured smooth and shining. Spine as long as the vesicle. Pectines with 23-25 teeth .... *I. vescus* (Karsch)

There is very little difference between these two species which themselves are rather variable, so they may represent but one species, in which case *I. vescus* of Karsch has priority.

Sub-Family CENTRURINAE

No tibial spurs on the third and fourth legs.

Genus ISOMETRUS

KEY TO THE SPECIES

Pectines with 16-19 teeth (rarely 15); tooth under the spine sharp and conical. Superior keels of the caudal segments without enlarged terminal tooth; distal segments of the tail not, or but little darker than the trunk .... *I. maculatus* (Geer)

Pectines with 10-13 teeth; tooth under the spine laterally compressed. Superior keels of the caudal segments, particularly the second and third with enlarged terminal tooth. Distal segments of the tail darker than the trunk .... *I. melanodactylus* (Koch)